



PV SOLAR POWER TECH

2700/3, Pallavangulam, Vadakar  
Opp Athikalathu Alangara Maligai, Pudukkottai - 622001  
Phone: 9655287856, 96552895  
Mail: pvsolarpowertech@gmail.com  
www.pvsolarpowertech.com

Date: 20.09.19

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai - 622 303.

Respected Madam,

Satisfied with the prior consultancy work offered by Department of Electrical and Electronics Engineering of the institution in solar panel estimation and selection, we would like to request the deployment of faculty members for on-site assessment and estimation.



For PV SOLAR POWER TECH

*Calvin*  
PROPRIETOR

Forwarded to

HOD/EEG

*[Signature]*  
20/9/19

*[Signature]*

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

"The Experts"

Su-Kam  
SOLAR

AMARON

APC  
by Schneider

LUMINOUS  
Inverter • UPS • Battery

MICROTEK  
TECHNOLOGY WE LIVE





# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,

**Kaikkurichi, Pudukkottai - 622 303.**

Date : 26.9.2019

To

PV Solar Power Tech,  
2700/3, Pallavankulam,  
Vadakarai,  
Pudukkottai - 622 001.

Dear Sir,

Greetings from Sri Bharathi Engineering College for Women!

With reference to the letter dated 20.09.2019, We are in immense pleasure for offering the opportunity to carry out the technical assistance in estimation of rating and numbers of Solar PV Panel required for your clients. Our college faculty from Department of Electrical and Electronics Engineering will carry out the proposed work within stipulated time. We would like to bring to your kind notice that the work may cost around Rs.3000 in total for a single estimation.

We are looking for your kind consideration and reply.

Thanking you

**Dr. S.THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

PRINCIPAL

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT





PV SOLAR POWER TECH

2700/3, Pallavangulam, Vadakar  
Opp Athikalathu Alangara Maligai, Pudukkottai - 6220  
Phone: 9655287856, 96552895  
Mail: pvsolarpowertech@gmail.c  
www.pvsolarpowertech.c

Date: 07.10.19

From

PV Solar Power Tech,  
2700/3, Pallavankulam,  
Vadakarai,  
Pudukkottai - 622 001.

1700 / EEG

for necessary action  
please

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai - 622 303.

07/10/19

Respected Madam,

We would like to confirm the quotation that we have received from your institution and approve Rs.3000, as an endowment towards successful submission of the estimation. We insist to start the work once you have received this letter and finish the work within 5 to 7 days.

For PV SOLAR POWER TECH

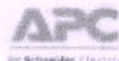
*Calabu*  
PROPRIETOR



*[Handwritten signature]*

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

"The Experts"







# **SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**CONSULTANCY PROJECT WORK**

**REPORT**

**Estimation of Power Rating and Numbers of Solar PV Panel Require For  
Installation in Domestic Appliances**

**SUBMITTED**

**TO**

PV Solar Power Tech,  
2700/3, Pallavankulam,  
Vadakarai,  
Pudukkottai – 622 001.

**REPORT DATE: 16.10.2019**

  
**Dr. S.THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.



As requested, / Order by PV Solar Power Tech, Pudukkottai dated 9.10.2019, the following are the details for your kind perusal.

**1. Load estimation**

Load	Watts	Hour/Day	Number of loads	Watt-Hr
CFL	23	6	3	414
CFL	18	5	2	180
Fan	60	11	2	1320
LCD TV (42'')	120	5	1	600
Total Daily Watt- Hour/day or Wh/day	345			2514

**1.a. Load Estimation with power factor of 0.8 approximately.**

Load	Watts	Hour/Day	Number of loads	Watt-Hr
CFL	23	6	3	414
CFL	18	5	2	180
Fan	60	11	2	1320
LCD TV (42'')	120	5	1	600
Total Daily Watt- Hour/day or Wh/day	431.25			3142.5

**2. Determining the inverter rating:**

The require energy is supplied from a battery bank through an inverter. The total load that would be connected to the inverter is around 432 [345/0.8] Watt.

Then, the inverters power handling capacity should be around 500 Watt as available in market.


**3. Daily energy supplied to the inverter:**

The daily energy consumed by the load is 3143 Wh.

The energy input to the inverter with the efficiency of 93%, is  $(3143)/(0.93) = 3379.56$  Wh, approximated to 3380 Wh.

**4. Deciding the system voltage:**

1 Battery of 24V can be used to have typical PV system voltage as 24V.

  
**Dr. S.THILAGAVATHI M.E.,Ph.D.,**  
 PRINCIPAL  
 SRI BHARATHI ENGINEERING  
 COLLEGE FOR WOMEN  
 Kaikkurchi - 622 303, Pudukkottai Dt.



### 5. Sizing of batteries:

The required charge capacity =  $(3380 \text{ Wh}) / (24 \text{ V}) = 140.8 \text{ Ah}$ .

The number of batteries of rating 24V,200 Ah with Depth of Discharge (DOD) of 70% required is  $(141 \text{ Ah}) / (100 \times 0.70) = 2.01$ , so 2 number of batteries can be preferred.

### 6. Sizing of PV modules:

The energy supplied at the input of battery terminal with battery efficiency of 90% is,  $(3143 \text{ Wh}) / (0.90) = 3492.2 \text{ Wh}$ .

The total Ampere hour to be supplied by PV Panel should be,  $3492 \text{ Wh} / (24 \text{ V}) = 145.5 \text{ Ah}$ .

The total amperes from the PV modules,  $(146 \text{ Ah}) / (8.5 \text{ h}) = 17.17 \text{ Ampere}$ .

The typical value of voltage and current of 440  $W_p$  module at maximum power point ( $V_m$  and  $I_m$ ) would be about 49 V and 11 A, respectively.

The number of PV modules required is,  $17.17 / 11 = 1.56$  Therefore, 2 PV Panels required as per calculation.

**Considering various environmental factors and solar efficiency 2 panels of rating 440  $W_p$  is required to deliver Total Daily Watt- Hour/day of 2514.**

### Design Details:

Sl. No	Description	Rating	Quantity
1.	Inverter	500 Watt	01
2.	Battery	24V, 200 Ah	02
3.	Solar PV Panel	440 $W_p$ , 49 V / 11 A	02

  
PROJECT INVESTIGATOR

[J. SATHYARAJ, AP/EEE]

  
PRINCIPAL

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303,  
PUDUKKOTTAI DISTRICT

  
Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kalkkurchj - 622 303, Pudukkottai Dt.





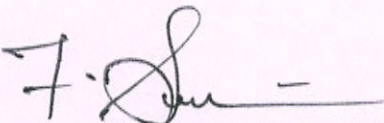
# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)  
Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

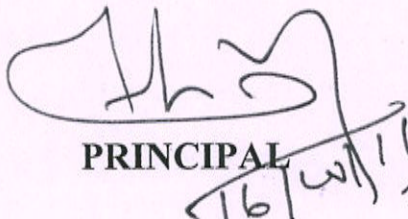
Date : ...16-10-2019.

## Utilization Certificate

Certified that the amount of rupees Rs.3000 (Three thousand only) was sanctioned by PV Solar Power Tech, Pudukkottai, during the academic year (2019-2020), in favour of Department of Electrical and Electronics Engineering, Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai has been fully utilized for Estimation of solar PV Panel requirement for your clients. The purpose of amount sanctioned has been fulfilled and delivered as per conditions of grant were satisfied.

  
PROJECT INVESTIGATOR  
[J. SATHYARAJ, AP/EEE]

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

  
PRINCIPAL  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT





PV SOLAR POWER TECH

2700/3, Pallavangulam, Vadakar  
Opp Athikalathu Alangara Maligai, Pudukkottai - 6220  
Phone: 9655287856, 96552895  
Mail: pvsolarpowertech@gmail.com  
www.pvsolarpowertech.com

Date: 03.07.19

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai – 622 303.

Respected Madam,

We look forward the quotation for Estimation of rating of Solar Photovoltaic Panel for domestic loads and other necessities, for our clients. In this connection the technical assistance may be invited from your institution by submitting as proposal for the above-mentioned work.



For PV SOLAR POWER TECH

*Calan*  
PROPRIETOR

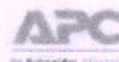
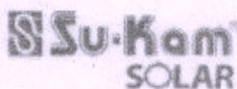
Forwarded to  
HOD / EEE

*R*  
03/07/19

*OLM*

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.

"The Experts"







# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

Date : 11/7/2019

To

PV Solar Power Tech,  
2700/3, Pallavankulam,  
Vadakarai,  
Pudukkottai - 622 001.

Dear Sir,

Greetings from Sri Bharathi Engineering College for Women!

With reference to the letter dated 3.7.2019, we are in immense pleasure for offering the opportunity to carry out the technical assistance in estimation of rating and numbers of Solar PV Panel required for your clients. Our college faculty from Department of Electrical and Electronics Engineering will carry out the proposed work within stipulated time. We would like to bring to your kind notice that the work may cost around Rs.3000 in total for a single estimation.

We are looking for your kind consideration and reply.

Thanking you

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT





PV SOLAR POWER TECH

2700/3, Pallavangulam, Vadakarai  
Opp Athikalathu Alangara Maligai, Pudukkottai - 6220  
Phone: 9655287856, 96552895  
Mail: pvsolarpowertech@gmail.co  
www.pvsolarpowertech.ct

Date: 19.07.19

From

PV Solar Power Tech,  
2700/3, Pallavankulam,  
Vadakarai,  
Pudukkottai - 622 001.

1400/EEG

for necessary approval  
and return please

19/07/19

To

The Principal,  
Sri Bharathi Engineering College for Women,  
Kaikkurichi,  
Pudukkottai - 622 303.

Respected Madam,

We would like to confirm the quotation that we have received from your institution and approve Rs. 3000, as an endowment towards successful submission of the estimation. We insist to start the work once you have received this letter and finish the work within 5 to 7 days.

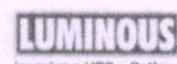
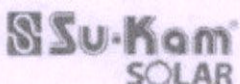
For PV SOLAR POWER TECH

PROPRIETOR



Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurchi - 622 303, Pudukkottai Dt.

"The Experts"







# **SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN**

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

**Kaikkurichi, Pudukkottai - 622 303.**

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**CONSULTANCY PROJECT WORK**

**REPORT**

**Estimation of Power Rating and Numbers of Solar PV Panel Require For  
Installation in Domestic Appliances**

**SUBMITTED**

**TO**

PV Solar Power Tech,

2700/3, Pallavankulam,

Vadakarai,

Pudukkottai – 622 001.

**REPORT DATE: 26.07.2019**

  
**Dr. S.THILAGAVATHI M.E., Ph.D.,**  
PRINCIPAL  
**SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN**  
Kaikkurichi - 622 303, Pudukkottai Dt.



As requested, / Order by PV Solar Power Tech, Pudukkottai dated 19.7.19, the following are the details for your kind perusal.

**1. Load estimation**

Load	Watts	Hour/Day	Number of loads	Watt-Hr
LED	10	7	5	350
BLDC Fan	30	11	3	990
LED TV (30'')	50	7	1	350
Laptop	45	5	1	225
Total Daily Watt- Hour/day or Wh/day	235			1915

**1.a. Load Estimation with power factor of 0.8 approximately.**

Load	Watts	Hour/Day	Number of loads	Watt-Hr
LED	10	7	5	350
BLDC Fan	30	11	3	990
LED TV (30'')	50	7	1	350
Laptop	45	5	1	225
Total Daily Watt- Hour/day or Wh/day	294			2393.75

**2. Determining the inverter rating:**

The require energy is supplied from a battery bank through an inverter. The total load that would be connected to the inverter is around 294 Watt [235/0.8].

Then, the inverters power handling capacity should be around 500 Watt to 1000 Watt as available in market.

**3. Daily energy supplied to the inverter:**

The daily energy consumed by the load is 2394 Wh.

The energy input to the inverter with the efficiency of 93%, is  $(2394)/(0.93) = 2574.19$  Wh, approximated to 2574 Wh.

  
**Dr. S.THILAGAVATHI** M.E., Ph.D.,  
 PRINCIPAL  
 SRI BHARATHI ENGINEERING  
 COLLEGE FOR WOMEN  
 Kaikkurchi - 622 303, Pudukkottai Dt.



#### 4. Deciding the system voltage:

2 Batteries each of 12V connected in series to have typical PV system voltage as 24V.

#### 5. Sizing of batteries:

The required charge capacity =  $(2574 \text{ Wh}) / (24 \text{ V}) = 107.25 \text{ Ah}$ .

The number of batteries of rating 12V, 100 Ah with Depth of Discharge (DOD) of 70% required is  $(107.25 \text{ Ah}) / (100 * 0.70) = 1.53$ , so 2 number of batteries can be preferred.

#### 6. Sizing of PV modules:

The energy supplied at the input of battery terminal with battery efficiency of 90% is,  $(2394 \text{ Wh}) / (0.90) = 2660 \text{ Wh}$ .

The total Ampere hour to be supplied by PV Panel should be,  $2660 \text{ Wh} / (24 \text{ V}) = 110.83 \text{ Ah}$ .

The total amperes from the PV modules,  $(110.83 \text{ Ah}) / (8 \text{ h}) = 13.84 \text{ Ampere}$ .

The typical value of voltage and current of 330  $W_p$  module at maximum power point ( $V_m$  and  $I_m$ ) would be about 37.67 V and 8.79 A, respectively.

The number of PV modules required is,  $13.84 / 8.79 = 1.57$ . Therefore, 2 PV Panels required as per calculation.

**Considering various environmental factors and solar efficiency 2 panels of rating 330  $W_p$  is required to deliver Total Daily Watt- Hour/day of 1915.**

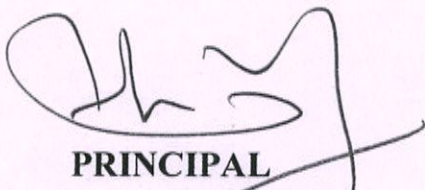
#### Design Details:

Sl. No	Description	Rating	Quantity
1.	Inverter	500/1000 Watt	01
2.	Battery	12V, 100 Ah	04
3.	Solar PV Panel	330 $W_p$ , 37.67V/ 8.79 A	02

  
PROJECT INVESTIGATOR

[S. SATHYARAJ, AP/EEE]

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt

  
PRINCIPAL  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303,  
PUDUKKOTTAI DISTRICT





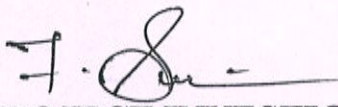
# SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)  
Pudukkottai - Aranthangi Road,  
Kaikkurichi, Pudukkottai - 622 303.

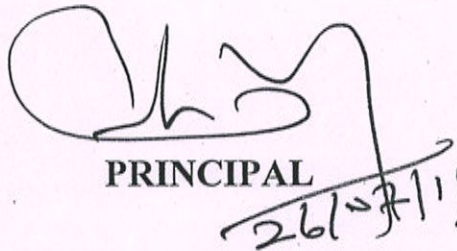
Date : 26/7/2019

## Utilization Certificate

Certified that the amount of rupees Rs.3000 (Three thousand only) was sanctioned by PV Solar Power Tech, Pudukkottai, during the academic year (2019-2020), in favour of Department of Electrical and Electronics Engineering, Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai has been fully utilized for Estimation of solar PV Panel requirement for your clients. The purpose of amount sanctioned has been fulfilled and delivered as per conditions of grant were satisfied.

  
PROJECT INVESTIGATOR  
[ J. SATYARAJ, AP/EE ]

Dr. S. THILAGAVATHI M.E., Ph.D.,  
PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
Kaikkurichi - 622 303, Pudukkottai Dt.

  
PRINCIPAL  
26/7/19

PRINCIPAL  
SRI BHARATHI ENGINEERING  
COLLEGE FOR WOMEN  
KAIKKURICHI - 622 303.  
PUDUKKOTTAI DISTRICT